Mental Disorders and Mental Health Problems, Active Component, U.S. Armed Forces, 2000-2011

Mental disorders account for significant morbidity, health care utilization, disability, and attrition from military service; the health care burden associated with mental disorders has increased over the last several years. During the years 2000 through 2011, 936,283 active component service members were diagnosed with at least one mental disorder. Annual counts and rates of incident diagnoses of mental disorders have increased by approximately 65 percent over the last twelve years; this overall increase is largely attributable to diagnoses of adjustment disorders, depressive and anxiety disorders, and post-traumatic stress disorder. Rates of incident mental disorder diagnoses were higher in females than males and in service members under 30 years of age. These findings reinforce previous reports that have documented a rise in demand for mental health services in the active component force and suggest that continued focus on detection and treatment for mental health issues is warranted.

mong U.S. military members, mental disorders account for significant morbidity, disability, health care utilization, and attrition from military service. In recent years, there have been continuous and steep increases in lost duty time and health care burden due to mental disorders. In 2011, mental disorders accounted for more hospitalizations of U.S. service members than any other diagnostic category and more ambulatory visits than any other category except musculoskeletal and connective tissue disorders and routine medical care (e.g., routine medical examinations, immunizations).²⁻⁴

In studies of mental disorders in military populations, "cases" are often identified by medical encounters documented with diagnosis codes 290 to 319 of the International Classification of Diseases, Clinical Modification (ICD-9-CM); these diagnoses generally correspond to psychiatric disorders documented in the Diagnostic and Statistical Manual, 4th edition (DSM-IV).⁵ However, some military mental health experts suggest that comprehensive assessments of the natures, burdens, and impacts of mental disorders in military populations should account for mental health problems that are not documented with

mental disorder-specific diagnosis codes. Such conditions include psychosocial and behavioral problems related to difficult life circumstances (e.g., marital, family, other interpersonal relationships; occupational, and other military-related stresses); they are often documented with V-codes of the ICD-9-CM. In some studies, service members who received mental health care (documented with V-coded diagnoses) were at greater risk of attrition from military service than those treated for only physical health conditions but at less risk of attrition than those who received mental disorderspecific ICD-9-CM diagnoses.6 In addition, Skopp et al. recently reported that service members with V-coded diagnoses indicating partner or family problems were at increased risk of suicide.7

This report summarizes numbers, natures, and rates of incident mental disorder-specific diagnoses (ICD-9-CM: 290-319) among active component U.S. service members over a twelve-year surveillance period. It also summarizes numbers, natures, and rates of incident "mental health problems" (documented with mental health-related V-codes) among active component members during the same period.

METHODS

The surveillance period was 1 January 2000 to 31 December 2011. The surveillance population included all individuals who served in the active component of the U.S. Armed Forces at any time during the surveillance period. All data used to determine incident mental disorder-specific diagnoses and mental health problems were derived from records routinely maintained in the Defense Medical Surveillance System. These records document both ambulatory encounters and hospitalizations of active component members of the U.S. Armed Forces in fixed military and civilian (if reimbursed through the Military Health System) treatment facilities.

For surveillance purposes, "mental disorders" were ascertained from records of medical encounters that included mental disorder-specific diagnoses (ICD-9-CM: 290-319, the entire "mental disorders" section of the ICD-9-CM coding guide [Table 1]) in the first or second diagnostic position; diagnoses of pervasive developmental disorder (ICD-9-CM: 299.xx), specific delays in development (ICD-9-CM: 315. xx), and mental retardation (ICD-9-CM: 317-319) were excluded from the analysis. Diagnoses of "mental health problems" were ascertained from records of health care encounters that included V-coded diagnoses indicative of psychosocial or behavioral health issues in the first or second diagnostic position (Table 1).

For summary purposes, mental disorder-specific diagnoses indicative of adjustment reaction, substance abuse, anxiety disorder, post-traumatic stress disorder (PTSD), or depressive disorder were grouped into categories defined by Seal et al. and previously reported in the *MSMR* with two modifications as follows: "depressive disorder, not elsewhere classified" (ICD-9-CM: 311) was included in the depression category instead of the "other mental diagnoses" category. Also, alcohol abuse and dependence diagnoses and substance abuse

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Diagnostic category	ICD-9 codes
ICD-9 mental disorders	
Adjustment disorders	309.0x-309.9x (excluding 309.81)
Alcohol abuse/dependence disorders	303.xx, 305.0x
Substance abuse/dependence disorders	304.xx, 305.2x-305.9x
Anxiety disorders	300.00-300.09, 300.20-300.29,300.3
Post-traumatic stress disorder	309.81
Depressive disorders	296.20-296.35, 296.50-296.55, 296.9x, 300.4, 311
Personality disorders	301.0, 301.10, 301.11, 301.12, 301.13, 301.20, 301.21 301.22, 301.3, 301.4, 301.50, 301.51, 301.59, 301.6 301.7, 301.81, 301.82, 301.83, 301.84, 301.89, 301.
Schizophrenia	295.xx
Other psychoses	293.81, 293.82, 297.0x-297.3x, 297.8, 297.9, 298.0 298.1, 298.2, 298.3, 298.4, 298.8, 298.9
Other mental health disorder	Any other code between 290-319 (excluding 305.7 299.xx, 315.xx, 317.xx-319.xx)
V-coded behavioral health disorder	
Partner relationship problems	V61.0x, V61.1, V61.10 (excluding V61.11, V61.12)
Family circumstance problems	V61.2, V61.23, V61.24, V61.25, V61.29, V61.8, V61.5
Maltreatment related	V61.11, V61.12, V61.21, V61.22, V62.83, 995.80 995.85
Life circumstance problems	V62.xx (excluding V62.6, V62.83)

Mental, behavioral problems, substance V40.xx (excluding V40.0, V40.1), V65.42

and dependence diagnoses were separated into two discrete categories. Diagnoses indicative of personality disorder or "other psychotic disorders" were grouped using the categories developed by the Agency for Healthcare Research and Quality (AHRQ). A case of schizophrenia was defined as an active component service member with at least one hospitalization or four outpatient encounters that were documented with schizophrenia-specific diagnoses (ICD-9-CM: 295). V-coded diagnoses indicative of mental health problems were grouped into five categories using previously published criteria (Table 1).6

abuse counseling

Each "incident diagnosis" of a mental disorder (ICD-9-CM: 290-319) or a mental health problem (selected V-codes) was defined by a hospitalization with an indicator diagnosis in the first or second diagnostic position; two outpatient visits within 180 days documented with indicator diagnoses (from the same mental disorder or mental health problem-specific category) in the first or second diagnostic positions; or a single outpatient visit in a

psychiatric or mental health care specialty setting (defined by Medical Expense and Performance Reporting System [MEPRS] code: BF) with an indicator diagnosis in the first or second diagnostic position. As described above, the case definition for schizophrenia required four outpatient encounters.

Service members who were diagnosed with one or more mental disorders prior to the surveillance period (i.e., prevalent cases) were not considered at risk of incident diagnoses of the same conditions during the period. Service members who were diagnosed with more than one mental disorder during the surveillance period were considered incident cases in each category in which they fulfilled the case-defining criteria. Service members could be incident cases only once in each mental disorderspecific category. Only service members with no incident mental disorder-specific diagnoses (ICD-9-CM: 290-319) during the surveillance period were eligible for inclusion as cases of incident mental health problems (selected V-codes).

RESULTS

During the 12-year surveillance period, 936,283 active component members were diagnosed with at least one mental disorder; of these individuals, 459,430 (49.1%) were diagnosed with mental disorders in more than one diagnostic category. Overall, there were 1,793,506 incident diagnoses of mental disorders in all diagnostic categories (Table 2a).

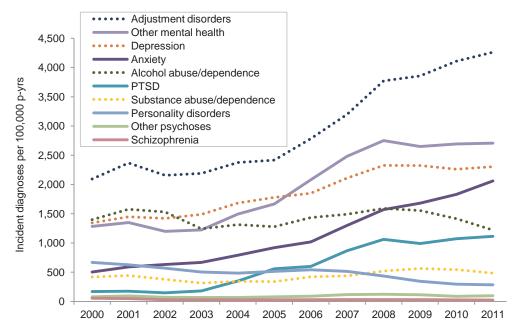
Among active component members, annual numbers and rates of incident diagnoses of at least one mental disorder increased by approximately 65 percent during the period (incident diagnoses of at least one mental disorder, by year: 2000: n=75,353, rate=5,387.1 cases per 100,000 person-years [p-yrs]; 2011: n=129,678, rate=8,900.5 per 100,000 p-yrs) (Table 2a).

Over the entire period, approximately 85 percent of all incident mental disorder diagnoses were attributable to adjustment disorders (n=471,833; 26.3%), "other" mental disorders (n=318,827; 17.8%), depressive disorders (n=303,880; 16.9%), alcohol abuse and dependence related disorders (n=232,625; 13.0%), and anxiety disorders (n=187,918; 10.5%); relatively few incident diagnoses were attributable to personality disorders (n=81,223; 4.5%), PTSD (n=102,549; 5.7%), and substance abuse and dependence related disorders (n=73,623; 4.1%) (Table 2a).

Crude rates of incident diagnoses of PTSD, anxiety disorders, depressive disorders, adjustment disorders, and other mental disorders generally increased during the period – particularly after 2003. In contrast, crude incidence rates of diagnoses of personality disorders, schizophrenia/ other psychoses, and alcohol and substance related disorders were relatively stable or declined during the period (Figure 1).

The relative percentage of all incident mental disorder diagnoses that occurred during the first six months of military service generally declined throughout the period. For example, during the entire 12-year surveillance period, approximately 1.5 percent of all incident PTSD diagnoses occurred within the first six months of service; notably, the proportion of PTSD diagnoses received within the first six months

FIGURE 1. Incidence rates of mental disorder diagnoses, by category, active component, U.S. Armed Forces, 2000-2011



of service declined from 8.9 percent in 2000 to 0.6 percent in 2011. The mental disorders that were relatively most frequently diagnosed in the first six months of service were personality disorders (7.5%), schizophrenia and other psychoses (7.5 and 7.1%, respectively), and adjustment disorders (6.1%) (data not shown).

In general, rates of incident mental disorder diagnoses were higher among females than males and declined with increasing age. For example, crude incidence rates of adjustment and personality disorders were more than twice as high among females than males; and crude incidence rates of anxiety and depressive disorders were between 1.4 and 1.9 times as high among females than males (Figure 2). Also, crude incidence rates of adjustment, PTSD, personality, "other" mental disorders and schizophrenia and other psychoses were higher among the youngest (<20 years old) compared to any older age group of service members; rates of alcohol/substance abuse were highest among those 20-24 years of age, and rates of anxiety disorders and depression were highest among those 25-29 years of age (Figure 3).

Overall incidence rates of mental disorders were higher in the Army than in any of the other Services (Figure 4). The Army

also had the highest crude incidence rates for each category of mental disorders except schizophrenia (data not shown). Crude incidence rates for adjustment disorders, anxiety, and personality disorders were higher among those in health care than any other military occupational group. Of note, rates of PTSD, depression, and alcohol and substance abuse disorders were higher among those in combat-specific than any other category of occupations (Figure 5).

During the surveillance period, there were 425,489 incident reports of mental health problems (documented with V-codes) among 361,489 active component members who were not diagnosed with a mental disorder (ICD-9-CM 290-319). During the period, nearly 70 percent of all incident reports of mental health problems were related to life circumstances (e.g., pending, current, or recent return from military deployment; bereavement; acculturation difficulties) (n=194,869; 45.8%) or partner relationships (n=98,492; 23.1%) (Table 2b).

Rates of mental health problems related to life circumstances were fairly stable from 2000 to 2003, increased to a sharp peak in 2005 (1,837.48 per 100,000 p-yrs), and then declined through 2008. This category increased again in 2009 (1,008.15 per 100,000 p-yrs) then declined slightly

(Figure 6). The crude incidence rate of life circumstance-related problems was more than 30 percent lower in the last (2011: 940.32 per 100,000 p-yrs) compared to the first year of the period (2000: 1,366.86 per 100,000 p-yrs).

A significant proportion of mental health problems related to life circumstances occur in the first six months of a service member's military service. In 2011, almost 10 percent of life circumstance related problems were diagnosed within the first six months of service; of note, in 2007 compared to 2011, the proportion was more than twice as high (21.2%). Rates of mental health problems related to mental, behavioral, and substance abuse difficulties steadily increased from 2002 through 2009 but declined slightly in the last two years (data not shown).

Rates of any mental health problem (as reported with V-codes) were relatively stable during the period compared to rates of any mental disorder diagnosis, which increased sharply after 2003 (Figure 7). In general, gender, age, service, and military occupation had similar relationships with rates of mental health problems as with mental disorder diagnoses (data not shown).

EDITORIAL COMMENT

This report provides a comprehensive overview of incident diagnoses of mental disorders and reports of mental health problems among active component members of the U.S. Armed Forces during the last 12 years. The report reiterates and reemphasizes previously reported increases in the numbers and rates of diagnoses of most categories of mental disorders in military members and documents a growing demand for mental health services among U.S. military members.

However, the nature and magnitude of mental health disorders and related problems in the military should be interpreted in a broader context. For example, a recently conducted, nationally representative survey of adults in the U.S. estimated that approximately one-half of all Americans will meet criteria for a mental disorder sometime in their lifetime; clearly, the large

TABLE 2a. Numbers and rates of incident diagnoses of mental disorders (ICD-9-CM: 290-319), by diagnostic category, active component, U.S. Armed Forces, 2000-2011

	Total (20	00-2011)	20	01	20	003	20	05	20	07	20	09	20	11
Category ^a	No.	Rateb	No.	Rateb	No.	Rateb	No.	Rate ^b	No.	Rateb	No.	Rateb	No.	Rate⁵
Adjustment disorders	471,833	2,952.4	30,451	2,366.9	30,343	2,190.1	32,379	2,418.0	41,783	3,200.2	51,593	3,857.4	55,409	4,263.8
Alcohol abuse/ dependence	232,625	1,419.2	20,381	1,575.9	17,408	1,243.4	17,431	1,279.5	20,003	1,490.7	21,746	1,554.9	16,920	1,220.0
Substance abuse/ dependence	73,623	434.2	5,860	441.9	4,539	314.3	4,773	338.8	6,086	437.1	8,212	563.0	7,003	484.8
Anxiety	187,918	1,129.2	7,802	591.2	9,549	667.9	12,771	920.1	17,721	1,299.5	23,763	1,680.0	28,565	2,061.1
PTSD	102,549	607.5	2,318	174.4	2,599	179.7	7,863	558.9	12,023	868.2	14,285	991.2	15,805	1,112.7
Depression	303,880	1,860.4	18,820	1,447.2	20,924	1,489.7	24,188	1,778.8	28,179	2,110.8	32,162	2,325.0	31,407	2,305.6
Personality disorders	81,223	479.8	8,281	626.0	7,264	504.6	7,222	514.1	7,130	513.2	5,014	343.7	4,110	284.2
Schizophrenia	5,572	32.7	650	48.8	429	29.6	412	29.1	453	32.4	440	29.9	351	24.1
Other psychoses	15,456	90.7	1,255	94.3	1,005	69.3	1,119	79.1	1,637	117.0	1,689	115.0	1,416	97.4
Other MH	318,827	1,958.4	17,555	1,350.8	17,198	1,222.2	22,720	1,667.5	33,007	2,481.8	36,320	2,650.9	36,394	2,707.5
No. of individuals	No.	Rate ^b	No.	Rate ^b	No.	Rate ^b	No.	Rate ^b	No.	Rate ^b	No.	Rateb	No.	Rate ^b
>1 category of mental health disorder	459,430	2,693.2	24,068	1,806.4	23,144	1,595.2	28,622	2,021.5	38,176	2,725.9	45,144	3,068.5	44,483	3,053.1
Any mental disorder diagnosis ^c	936,283	5,488.6	78,429	5,886.3	77,822	5,364.0	87,683	6,192.9	109,011	7,783.8	124,503	8,462.6	129,678	8,900.5

^aEach individual may be a case within a category only once per lifetime

TABLE 2b. Numbers and rates of incident diagnoses of mental health problems (V-coded mental health visits) among those WITHOUT a mental disorder diagnosis (ICD-9-CM: 290-319), active component, U.S. Armed Forces, 2000-2011

	Total (2000-2011)		2001		2003		2005		2007		2009		2011	
Categorya	No.	Rate⁵	No.	Rateb	No.	Rate⁵								
Partner relationship	98,492	595.7	8,920	684.3	8,150	577.1	8,361	609.5	8,018	593.5	7,193	507.7	6,972	497.6
Family circumstance	38,495	227.9	3,393	256.3	3,684	256.2	2,358	168.2	2,634	190.1	3,217	221.4	3,726	259.4
Maltreatment related	21,690	128.2	2,887	218.4	2,197	152.8	1,816	129.4	1,300	93.7	709	48.6	797	55.1
Life circumstance problem	194,869	1,189.0	18,937	1,459.1	16,360	1,166.0	24,887	1,837.5	13,397	1,003.4	14,134	1,008.2	13,050	940.3
Mental, behavioral & substance abuse	71,943	426.8	4,088	308.2	3,834	266.0	5,397	384.9	6,674	483.2	9,487	657.4	7,432	521.9
No. of individuals	No.	Rate⁵	No.	Rateb	No.	Rateb	No.	Rate⁵	No.	Rateb	No.	Rateb	No.	Rate ^b
>1 type of V-code	52,456	307.5	3,478	261.0	2,822	194.5	2,933	207.2	2,721	194.3	2,524	171.6	2,631	180.6
Any V-code	361,489	2,119.1	34,143	2,562.5	30,972	2,134.8	39,440	2,785.6	29,048	2,074.1	31,948	2,171.6	28,997	1,990.2

^aEach individual may be a case within a category only once per lifetime

and growing problem of mental disorders among military members reflects to some extent the similar experience of the general U.S. population.¹⁰

The increases in rates of most categories of mental disorders after 2003 may reflect an increasing psychological toll among participants in Operations Iraqi Freedom (OIF) and Enduring Freedom (OEF). Most notably in this regard, the rate of incident diagnoses of post-traumatic stress disorder (PTSD) increased nearly sixfold from 2003 to 2008. This report did not

specifically examine mental disorder diagnoses in relation to repeated deployments. However, other analyses have documented that greater percentages of deployed personnel have been diagnosed with PTSD and anxiety related disorders after second and third deployments than first deployments, but that the percentages of deployers diagnosed with PTSD were lower after fourth and fifth deployments than third deployments. More detailed investigation into the relationship between deployment and mental health outcomes is warranted.

The results of this report should also be interpreted in light of the significant changes in Department of Defense (DoD) mental health-related policies, enhancements of mental health education, outreach, and screening efforts, and increases in mental health care resources. For example, the DoD has made significant efforts to reduce stigmas associated with care seeking for and treatment of mental illnesses and to remove barriers to receiving timely and appropriate diagnostic and treatment services. Undoubtedly, such changes have

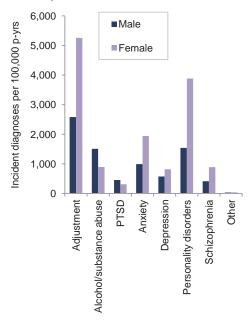
bIncident diagnoses per 100,000 p-yrs

^cAt least one reported mental disorder diagnoses

blncident diagnoses per 100,000 p-yrs

^cAt least one reported mental health problem (V-coded diagnosis)

FIGURE 2. Incidence rates of mental disorder diagnoses, by category and gender, active component, U.S. Armed Forces, 2000-2011



resulted in increases in the detection and treatment of previously undiagnosed mental disorders and more complete documentation of mental disorders in electronic medical records. Such records are routinely used for health surveillance activities such as the analyses reported here and elsewhere in this issue.

The findings of this report in regard to age-related risk are consistent with the findings of other studies in veteran and active military populations. Most notably, for most categories of mental disorders, rates of incident diagnoses were highest among the youngest (and thus likely most junior) service members. Several factors likely contribute to the finding. For example, recruit training and first time experiences in active combat are among the most psychologically stressful of all military activities. Recruits are the youngest and most junior of all military members; and among all deployed service members, the most junior are most likely to be experiencing their first lifetime exposures to combat. Also, the endpoints of analyses in this report were incident (i.e., first ever during military service) diagnoses of mental disorders; thus, even if the prevalences of a disorder were similar across age groups,

rates of incident diagnoses of the disorder would likely decrease with age (because in younger versus older age groups, relatively more of the diagnoses would be considered incident diagnoses, i.e., documented for the first time in their military service careers). Also, because of real or perceived stigmas and/or fears of negative impacts on their military careers, older (and higher ranking) service members may be more reluctant to seek mental health care than those who are younger. In addition, studies of U.S. and United Kingdom military members have documented that mental disorders and mental health problems are associated with higher rates of attrition from military service; thus, compared to their counterparts, individuals with mental health problems likely leave military service sooner and at younger ages. 1,12,13

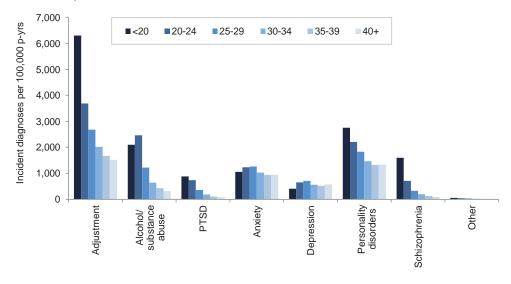
Of interest, service members in health care occupations had relatively high rates of incident diagnoses of most types of mental disorders. In particular, rates of incident diagnoses of PTSD were similar among those in health care and combat-specific occupations. The finding likely reflects, at least in part, increased access to and utilization of health care services by medical personnel in general. It likely also reflects the effects of the psychological stresses inherent to many health care roles, particularly in wartime. Studies of deployed military medical personnel in the Armed Forces of the United Kingdom have demonstrated

higher rates of psychological distress in medical personnel.¹⁴

This analysis did not consider the effects of deployment-related experiences on the incidence of mental disorders. Many researchers have examined the effects of deployment in general and combat exposure specifically on rates of diagnosed mental disorders. For example, in 2008, Larson and colleagues documented mental disorder diagnoses among U.S. Marines who had recently served in OEF/OIF; among those with no predeployment mental disorder diagnoses, rates of all types of mental disorders except PTSD were lower among combat-deployed than non-combat deployed Marines.¹⁵ MSMR analyses have documented that deployers who were diagnosed with mental disorders before deploying were more than twice as likely as their counterparts to receive mental disorder diagnoses after deploying.9 Among veterans of OEF/OIF service in general, combat exposure is a strong predictor of post-deployment anxiety diagnoses, including among those with no predeployment histories of mental disorders.16 Hoge and colleagues documented that mental health outcomes are correlated with combat experiences; in particular, combat veterans had more post-deployment psychiatric problems than their counterparts who served in non-combat locations.17

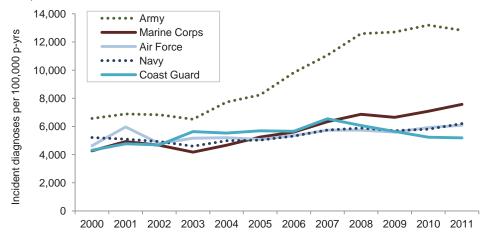
There are significant limitations to this report that should be considered when

FIGURE 3. Incidence rates of mental disorder diagnoses, by category and age group, active component, U.S. Armed Forces, 2000-2011



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FIGURE 4. Incidence rates of mental disorder diagnoses, by service and year, active component, U.S. Armed Forces, 2000-2011



interpreting the results. For example, incident cases of mental disorders and mental health problems were ascertained from ICD-9-CM coded diagnoses that were reported on standardized administrative records of outpatient clinic visits and hospitalizations. Such records are not completely reliable indicators of the numbers and types of mental disorders and mental health problems that actually affect military members. For example, the numbers reported here are underestimates to the extent that affected service members did not seek care or received care that is not routinely documented in records that were used for this analysis (e.g., private practitioner, deployed troop clinic); that mental disorders and mental health problems were not diagnosed or reported on standardized records of care; and/or that some indicator diagnoses were miscoded or incorrectly transcribed on the centrally transmitted records. On the other hand, some conditions may have been erroneously diagnosed or miscoded as mental disorders or mental health problems (e.g., screening visits). Finally, the analyses reported here summarize the experiences of individuals while they were serving in an active component of the U.S. military; as such, the results do not include mental disorders and mental health problems that affect members of reserve components or veterans of recent military service.

Finally, as with most health surveillance-related analyses among U.S. military members, this report relies on data in the Defense Medical Surveillance System (DMSS). The DMSS integrates records of nearly all medical encounters of active component members in fixed (i.e., not deployed or at sea) military medical facilities. Administrative medical record systems, like DMSS, enable comprehensive surveillance of medical conditions of interest through identification of likely cases; such cases are identified by using surveillance case definitions that are based entirely or in part on indicator ICD-9-CM codes. Other considerations in the construction of surveillance case definitions include the clinical setting in which diagnoses of interest are made (e.g., hospitalization, relevant specialty clinic), frequency and timing of indicator diagnoses, and the priority with

which diagnoses of interest were reported (e.g., first-listed versus subsequent reported diagnoses). The accuracy of estimates of the numbers, natures, and rates of illnesses and injuries of surveillance interest depend to a great extent on specifications of the surveillance case definitions that are used to identify cases. For this analysis, the medical literature and subject matter experts were consulted prior to creating the surveillance case definitions that were used to identify the mental health conditions of interest for this report. If case definitions with different specifications were used to identify cases of nominally the same conditions, estimates of numbers, rates, and trends would vary from those reported here. 18,19

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FIGURE 5. Incidence rates of mental disorder diagnoses, by category and military occupation, active component, U.S. Armed Forces, 2000-2011

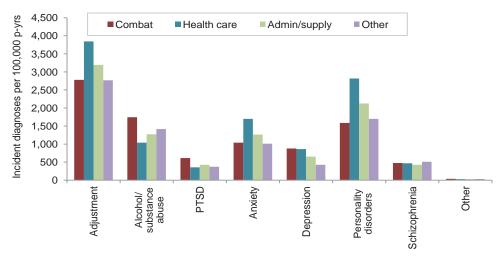


FIGURE 6. Incidence rates of mental health problems (V-coded mental health visits) among those WITHOUT a mental disorder, by category and year, active component, U.S. Armed Forces, 2000-2011

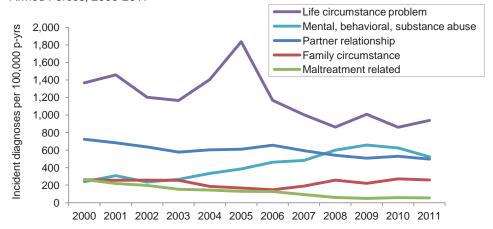
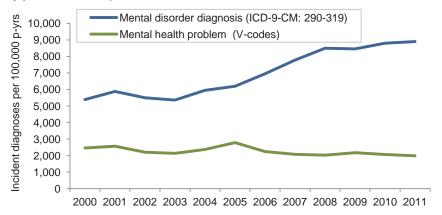


FIGURE 7. Incidence rates of any mental disorder diagnosis or any mental health problem, by year, active component, U.S. Armed Forces, 2000-2011



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